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The correct name, species diagnosis, and distribution of the Sicilian shrew

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Abstract. New karyological and morphological data show that Sicily, the Egadi Islands, Malta and Gozo are (ore were) inhabited by a particular species of *Crocidura*, for which the name *Crocidura sicula* Miller, 1901 is available. The species is briefly diagnosed and described and a new key to the European species of *Crocidura* is presented.

Key words. Mammalia, Soricidae, *Crocidura sicula*, Mediterranean Islands.

The discovery of a new karyotype not shared by any other European *Crocidura* species (Vogel 1988) once again raised the question of the correct status of the white-toothed shrews of Sicily and surrounding archipelagos. We do not wish to repeat all the different views about these animals here; table 1 shows the variety of taxonomic opinions expressed in the scientific literature from 1879 to present.

Table 1. Species allocations of white-toothed shrews of Sicily and adjoining islands expressed in the literature since 1879. According to the authors' results, all populations belong to the same species.

Taxon/Island	Sicily	Egadia Is.	Malta	Gozo
sicula	x			
caudata	x			
suaveolens	x	x	x	x
russula	x		x	x
leucodon	x			

The new karyotype (2 n = 36, NF = 56) revealed the existence of a different species in Sicily, but its correct name had still to be fixed. It remained also unclear whether there occurs more than one species of *Crocidura* in Sicily, a view adopted by Vesmanis (1976) in a recent taxonomic study of the *Crocidura* species of Sicily.

In this note we present a solution of the problem, to which we came almost independently with different approaches and methods, including morphological and statistical studies of recent and fossil materials as well as karyological and biochemical techniques.

Our main results are as follows:

— We found no evidence for the presence of more than one species of *Crocidura* in Sicily. A multivariate analysis of skull measurements along an east-west and a noth-south gradient showed no biometrical differences (Sarà et al., in prep.). We therefore conclude that all available specimens belong to the same taxon, confirming the interpretation of Contoli et al. (1989). The holotypes of the two species described from

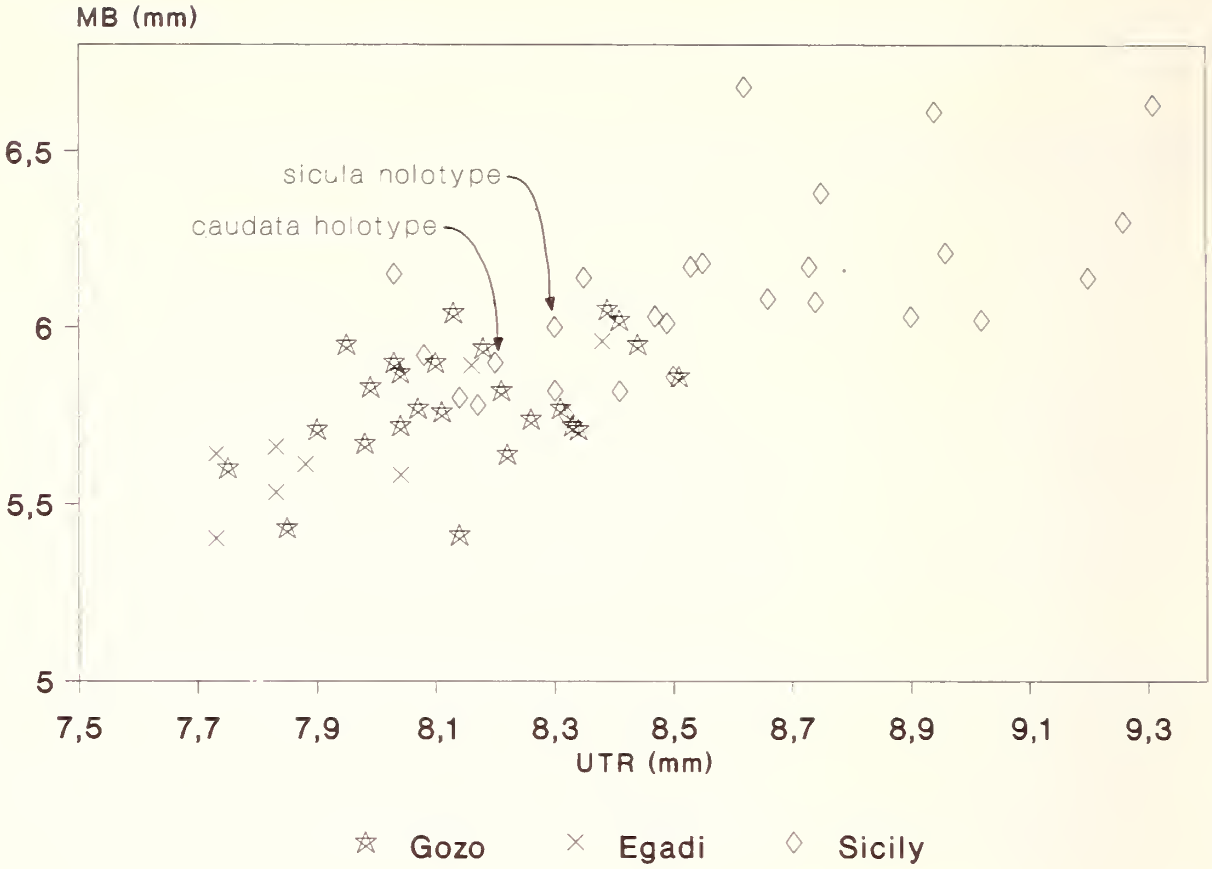

Fig. 1: A bivariate scatter diagram of upper toothrow length (UTR) and maxillary breadth (MB) for recent populations of *Crocidura sicula* from Sicily, the Egadi Islands, and Gozo (Measurements by R. Hutterer). The positions of the holotypes of *Crocidura sicula* and *C. caudata* (data taken from Vesmanis 1976) are indicated.

Sicily, *Crocidura sicula* Miller, 1901 and *C. caudata* Miller, 1901 fit well into the range of our material (Fig. 1), except for the longer tail measurement of the holotype of *caudata*; however, Vesmanis (1976) has shown that Miller (1901, 1912) gave contradictory information on the external measurements of the holotype and that the somewhat high value for the tail length may be artificial. On the other hand we found that the small size of the holotype of *sicula*, taken by several authors as evidence for the presence of a second species in Sicily, is not unique but is matched by other specimens which all show the diagnostic qualitative characters of the Sicilian shrew (see below). Moreover, the measurements taken by A. L. Gardner (in Vesmanis 1976: tab. 2) from the type specimens show that the *sicula* type is larger than the *caudata* type in some cranial distances such as upper toothrow length (Fig. 1).

— Specimens from Gozo have the same karyotype as specimens from Sicily (Vogel et al., in prep.).

— Recent specimens from the Egadi Islands and fossil specimens from Malta show the same morphological characters (Fig. 2) as specimens from Sicily and Gozo, although all populations differ in size (Hutterer, unpubl.; fig. 1). In a multivariate analysis (Sarà et al., in prep.) all these populations group nicely together and are set apart from a *C. russula* sample from Sardinia.

We conclude that all shrew populations mentioned in tab. 1 belong to the same species, for which we select the name *Crocidura sicula* Miller, 1901. This name was

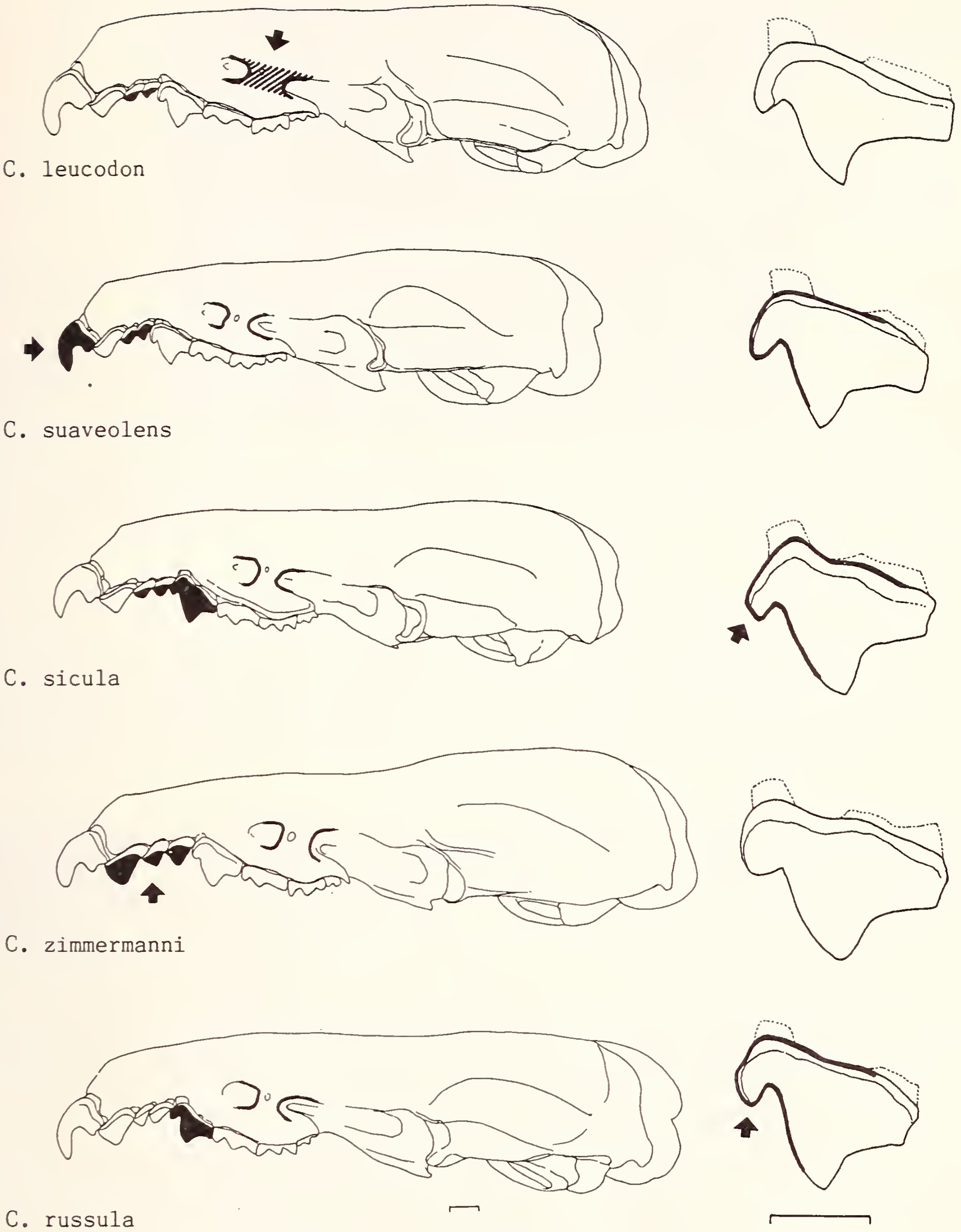

Fig. 2: A comparison of the skulls and the external view of the P⁴ of the European species of *Crocidura*. Features which are helpful for indification are drawn in black or are emphasized by thick lines; arrows point to a unique character of each species. Scale is 1 mm. Design by R. Hutterer.

the first given to a shrew from Sicily and has been used by various authors, either as a species or subspecies name. Miller (1901, 1912) referred a series of 9 specimens to *C. sicula*, demonstrating that he himself regarded this as the common species of Sicily, while *C. caudata* was based upon a single aberrant shrew. The name *C. caudata* was used provisionally by Vogel (1988) but should now be replaced definitively by

Crocidura sicula. Below we give a formal account of these species including diagnostic characters which we found to be useful for determination.

Crocidura sicula Miller, 1901

1879 *Crocidura sicula* Giglioli, Arch. Naturgesch. 1879: 96 (nomen nudum).
1901 *Crocidura sicula* Miller, Proc. biol. Soc. Wash. 14: 41.
1901 *Crocidura caudata* Miller, Proc. biol. Soc. Wash. 14: 42.

Holotype: USNM 103301, skin and skull of a young male from Palermo, Sicily, collected by D. Coolidge on 20 June 1900.

Diagnosis: A medium-sized shrew in the size range of *C. suaveolens* and *C. russula*, sharply bicoloured with a whitish undersurface, whitish fore- and hindfeet, and a bicoloured tail (Fig. 3). Rostrum of skull rather flat and slender but bimaxillary region broad as in *C. russula.* Infra-orbital bridge narrow. Tips of the second and third upper unicuspid teeth usually in one line with the tip of the parastyle of the P^4; parastyle of P^4 massive and angular like a brick (Fig. 2), dorsal edge of the cingulum of P^4 undulated, not straight; third upper molar narrow.

Distribution: the whole island of Sicily (Vesmanis 1976: fig. 14, Massa & Sarà 1982); the Egadi Islands Favignana, Marettimo, Levanzo (Krapp 1970), and Ustica (Sarà et al., in prep.); Gozo (Sultana 1971, Schembri & Cachia Zammit 1979, Schembri & Schembri 1979), known as subfossils from Malta (Storch 1970) where it is now extinct. It is possible that also the Pleistocene material described by Kotsakis (1986) belongs to this species.

Remarks: Although there exist considerable size differences between the island populations, they all share the same morphological characters mentioned in the diagnosis (Hutterer, unpubl.). The intraspecific variation and a comprehensive comparison with all European and North African species, including the fossil forms (Malec & Storch 1970, Kotsakis 1986), will be published at a later date. Fig. 2 presents a brief comparison of the skulls of the five European species of the genus *Crocidura*, *C. leucodon*, *C. suaveolens*, *C. sicula*, *C. zimmermanni* and *C. russula*, and includes some useful characters for identification. By combining colour and skull characters, a simple key to the European species can be constructed:

1. Body and tail distinctly bicoloured, transition between dorsal and whitish ventral colouration sharp 2
   Body and tail not distinctly bicoloured, no sharp transition line between venter and dorsum 3
2. Infraorbital bridge very broad (Fig. 2) .... *C. leucodon*
   Infraorbital bridge narrow, parastyle of P^4 angular like a brick .... *C. sicula*
3. Upper second and third unicuspid teeth shorter than the parastyle of P^4 *C. suaveolens*
   Upper second and third unicuspid teeth longer than the parastyle of P^4 4
4. Upper unicuspids very large with thick cingula, parastyle of P^4 rounded *C. zimmermanni*
   Upper unicuspids not enlarged and with weak cingula, parastyle of P^4 hook-like *C. russula*

C. sicula and *C. zimmermanni* are insular species with a very limited distribution; both shrews are probably relics of the Pleistocene Mediterranean fauna (Reumer 1986, Vogel et al., in prep.).

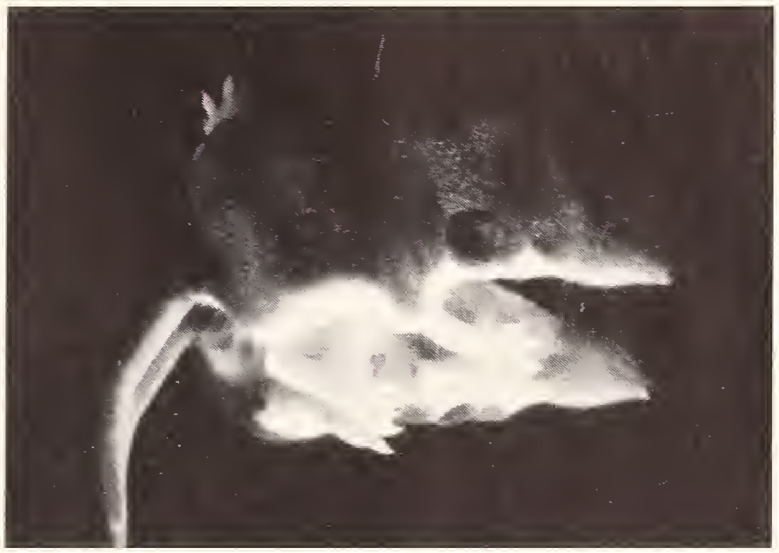

Fig. 3: A juvenile *Crocidura sicula* from Gozo shows a sharply contrasting colour pattern; in adults the contrast becomes less obvious. Photo by P. Vogel.

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Zusammenfassung

Neue karyologische und morphologische Befunde zeigen, daß auf den Mittelmeerinseln Sizilien, Egadi, Malta und Gozo eine endemische Spitzmausart lebt(e), für die der Name *Crocidura sicula* Miller, 1901 verfügbar ist. Die Art wird neu definiert; außerdem wird ein neuer Bestimmungsschlüssel zu den europäischen Arten der Gattung *Crocidura* vorgeschlagen.

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